

Office Action Summary

Application No.

10/542,830

Applicant(s)

SETOMOTO ET AL.

Examiner

David R. Crowe

Art Unit

2885

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9, 10 and 14-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9, 14, 15 and 17-22 is/are rejected.
- 7) ☒ Claim(s) 10 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

The amendment filed March 27, 2007 has been entered.

Claim Objections

1. Claim 10 is objected to because of the following informalities: to remain consistent with the independent functionality of the modules presented in claim 9, the following suggestions are made: change "terminal" in line 13 to - terminals--, change "circuit" in line 13 to -circuits--, change "reduces" in line 13 to -reduce--, change "stops" in line 13 to -stop--, insert -at least one of--between "supplied to" and "the LED" in line 14.
2. Claim 19 is objected to because of the following informalities: "unit" in line 15 should read - units- -. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 14, 17-22 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 14: The claim is incomplete for failing to provide the element from which each module is to be detachable. The parent claims fail to provide proper support that the modules are attached to one another and only seem to infer connection with a power supply.

Re claims 17, 18, 21 and 22: The claims are indefinite because they combine the thermal element unit with the current detection unit. These elements are described in the alternative in the specification and the claims are unclear as to how they can be used in combination.

Re claims 19-20 recite the limitation "luminous intensity stabilization circuit" in lines 18-19. There is insufficient antecedent basis for this limitation in the claim.

Claims 19-22 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: The locations of the voltage circuit, current detection unit and logical circuit are indefinite. It must be made apparent in the claims which elements reside as part of an LED module and which elements are separate and used one element for the entire lighting device as understood to be essential to the inventive concept presented in the disclosure.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2885

6. Claims 9, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katogi et al (US 2002/0114155) in view of Shirai (US 5,598, 068) in further view of Fai (US 6144160).

Re claims 9 and 15: Katogi discloses a lighting device including a plurality of LED modules [illumination units 100, 200 with light emitting elements 12] comprising a main substrate [printed circuit board 11]; an LED mounting unit composed of one or more LED chips [12, LED's must inherently include the emitter chips] mounted on a main surface of the main substrate; a power supply terminal [50] operable to receive power from an electric power supply; and a luminous intensity stabilization circuit [control circuit 40] connected to the power supply terminal and the led mounting unit. [The control circuit is interpreted as a luminous intensity stabilization circuit because it controls the current to the light sources and it is known in the art that LED's run on a constant current therefore making the control circuit a constant current circuit and therefore reading on the stabilization circuit as suggested in the claims as no specific feature of the stabilization circuit is given to differentiate it from a standard current control circuit.]

Although figure 2 of Katori shows the power supply circuit on the bottom of the substrate, it would have been obvious to one of ordinary skill in the art to place it on the same surface to ease manufacturability.

Although Katori teaches units 100 and 200 being without control circuitry for cost purposes, it would have been obvious to one of ordinary skill in the art that a plurality of

Art Unit: 2885

main units [10] could be used in combination to provide protection against failure due to redundancy in design.

However, Katori fails to teach a thermal element unit.

Shirai discloses a light emitting apparatus having a temperature sensor [thermistor 64] adjacent to the LED's so when a rise in temperature is detected, it adjusts the control bias [interpreted as a judgment signal] to reduce the current applied from the current source. [See column 2 lines 60-67]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a temperature sensor near the LED's of each lighting unit of Katori and therefore control the current to each unit individually so that "A broken LED and/or current source does not affect other LEDs and/or current sources. Also adjustment of the current flowing through the LED's as a function of temperature is desired to prolong the LED lifetime," as suggested by Shirai in column 2, lines 7-14. Units are further desirable in each unit individually as seen in figure 9 of Katori in which the units are spaced far apart, significantly different ambient temperatures may be present due to air flow in a room, direct sunlight etc.

However, Katori modified by Shirai fails to teach a comparator as part of the thermal element unit.

Fai teaches a temperature sensing circuit for a lamp protection circuit including a sampling circuit and a comparing circuit. [See claim 1]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the temperature sensor [thermistor] of Shirai with the

temperature sensing circuit [thermal element] and comparing circuit [comparator] of Fai in order to protect against both temperature and non-temperature related abnormalities. [See Fai column 2 lines 36-44].

Note: "The plurality of LED modules" is only found in the preamble of the claim and is therefore not given patentable weight in the claim. This interpretation is taken since no structural limitations are recited in the claim to determine the functional or physical relationships between the modules. There the recitation of a plurality is simply a matter of duplication of the working parts of the invention and would be within the ordinary skill in the art to provide a number of the units.

Re claim 14: Katori teaches each unit is detachable via connector [21].

7. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katogi in view of Nomiya et al (US 4,068,148).

Re claim 19: Katogi discloses a lighting device including a plurality of LED modules [illumination units 100, 200 with light emitting elements 12] comprising a main substrate [printed circuit board 11]; an LED mounting unit composed of one or more LED chips [12, LED's must inherently include the emitter chips] mounted on a main surface of the main substrate; a power supply terminal [50] operable to receive power from an electric power supply; and a constant current circuit [control circuit 40] connected to the power supply terminal and the led mounting unit. [The control circuit is

interpreted as a luminous intensity stabilization circuit because it controls the current to the light sources and it is known in the art that LED's run on a constant current therefore making the control circuit a constant current circuit and therefore reading on the stabilization circuit as suggested in the claims as no specific feature of the stabilization circuit is given to differentiate it from a standard current control circuit.]

Katogi further teaches a constant voltage circuit demonstrated by converting AC to DC [52]. [See figures 5 and 6].

Although figure 2 of Katori shows the power supply circuit on the bottom of the substrate, it would have been obvious to one of ordinary skill in the art to place it on the same surface to ease manufacturability.

Katogi fails to teach a current detection unit or a logical circuit.

Nomiya discloses a constant current driving circuit for driving light emitting diodes including a variation detecting circuit [current detection unit] and a logic circuit. "Where the driving FET's provide an electric current larger than a predetermined value, the detecting FET [detection unit interpreted as a comparator as it must provide an adjustment based on the bias potential] will also provide an increased current which causes...a decrease in the driving current flowing through the LED's. [See column 2 lines 33-53 and column 3 lines 9-47.]

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the constant current circuit of Nomiya including the detecting circuit and logic circuit as the control circuit of Katogi in order to use FET instead of

resistors which allows of the reduction of parts and increased efficiency as suggested by Nomiya in column 1 lines 29-45.

Re claim 20: Katori teaches each unit is detachable via connector [21].

Response to Arguments

8. Applicant's arguments with respect to claims 9 and 14 have been considered but are moot in view of the new ground(s) of rejection.
9. Applicant's arguments with respect to claim 10 have been fully considered and are persuasive. The rejection of claim 10 has been withdrawn.
10. With respect to newly added claim 19, the applicant is directed to the rejection above in paragraph 7.

Allowable Subject Matter

11. Claims 10 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to disclose or fairly suggest the claimed combination of thermal element, logical circuit and LED module. Claim 10 as viewed as the short hand form of claims 9 and 10 includes the limitation of one logic circuit and one voltage circuit connected to all of the LED modules therefore positively claiming the necessity of

multiple modules each with a thermal element and stabilization circuit connected together by the voltage circuit as specifically called for the claim combination.

12. Claims 17 and 18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 21 and 22 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter: Claims 17 and 21 require the combination of the thermal element unit containing a comparator and a current detection unit with a comparator for detecting current irregularities. The prior art of record fails to suggest or render obvious the combination of these elements as specifically called for in the claimed combination and would be allowable over the prior art of record if the claims are rewritten to overcome all the rejections under 35 USC 112 second paragraph.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David R. Crowe whose telephone number is 571-272-9088. The examiner can normally be reached on 7:30AM-5:00PM w/first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on 571-272-7044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

DRC



JONG-SUK (JAMES) LEE
SUPERVISORY PATENT EXAMINER